

Microsoft® System Builder Preinstallation User's Guide for Windows® Millennium Edition

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Welcome

Welcome to the *Microsoft System Builder Preinstallation User's Guide for Windows Millennium Edition*. The following is a set of instructions for setting up and testing Microsoft® Windows® Millennium Edition preinstallation. For more details about the preinstallation process, please refer to the Help file in the System Builder (SB) Preinstallation wizard.

Before you set up the Preinstallation wizard, you must read "Getting Started: How to Set Up the System Builder Preinstallation Wizard for Windows Millennium Edition." This document contains instructions to help you set up the **Wizard** folder that contains the SB Preinstallation wizard.

Note The preinstallation instructions and tools referenced in the "Getting Started" document and in *Microsoft System Builder Preinstallation User's Guide for Windows Millennium Edition* are intended for use only by System Builders and may not be disclosed or distributed to end users.

Why Preinstall Windows?

As a System Builder who distributes assembled computer systems running Windows Millennium Edition, you're required to preinstall the Windows Millennium Edition operating system by using the System Builder Preinstallation Kit tools rather than using Windows Millennium Edition Setup. Preinstallation allows the end user to read the end-user license agreement (EULA), enter a Product Key from the Certificate of Authenticity (COA), type a user name, and experience the updated Windows Welcome.

During preinstallation, you can add your System Builder brand name and company logo to the user interface and provide end-user information about your unique support programs. During preinstallation, you also have the opportunity to test the operating system and to preinstall applications on the computer before you ship it to the customer.

Document Conventions

This document uses the following typographical conventions to help you quickly locate and identify information.

| This type style | Is used for |
|------------------------|--|
| bold | UI items (menu and command names, options, and so on), folders, utility names, switches, and any text you must type exactly as it appears. |
| <i>italic</i> | Parameters, placeholders, titles, and definitions. In the case of parameters, you can supply the text for any item shown in italic. Parameter examples include your appropriate file name or drive letter. |
| monospace | Code samples and syntax examples. |
| ALL CAPITALS | Acronyms and key names. When you type folder names and file names in a path, you can use lowercase letters. |

In file paths such as **PC:\Windows\System**, "PC:" indicates the target computer.

Basic Terminology

The following terms are used throughout this guide.

auditing The task by which the System Builder tests the Windows Millennium Edition configuration and preinstalls programs during the final phase of the preinstallation process.

configuration set A group of files containing the configuration settings that control the preinstallation process and define the manufacturer's custom information.

end user The customer who receives the computer that has Windows Millennium Edition preinstalled.

ISP sign-up offer The HTML file or set of files that appears during Windows Welcome. These files lead the end user through the process of establishing an account with an Internet service provider (ISP).

OEM (Original Equipment Manufacturer) or SB (System Builder) The company that ships assembled computer systems with the System Builder version of Windows Millennium Edition

preinstalled under a license agreement with Microsoft Licensing, Inc., a subsidiary of Microsoft Corporation.

preinstallation The process in which the OEM transfers the Windows Millennium Edition operating system, OEM-supplied drivers, and program files to a computer by using System Builder Kit tools.

SB Preinstallation wizard A System Builder Kit (SBK) tool that provides an easy interface for creating the preinstallation configuration set.

target computer The end-user computer on which Windows Millennium Edition is to be preinstalled.

Windows Millennium Edition The Microsoft Windows Millennium Edition (Windows Me) operating system product, including any current service releases.

Windows Welcome The initial startup sequence for Windows Millennium Edition; also referred to as "out-of-box experience (OOBE)." Through a series of full-screen, HTML-based pages, Windows Welcome offers end users an easy and streamlined way of getting a personal computer that is running a newly preinstalled copy of Windows Millennium Edition started and connected to the World Wide Web.

System Builder Preinstallation Requirements

This section contains information about the requirements and restrictions for preinstalling Windows Millennium Edition. Microsoft Licensing, Inc., a subsidiary of Microsoft Corporation, licenses its OEM customers with the right to acquire and preinstall software, according to the terms of its license agreement. OEMs must acquire all approved end-user deliverables as provided by Microsoft Licensing, Inc. from Authorized Replicators. No OEM has the right to place Microsoft intellectual property on any form of medium without the express written consent of Microsoft Licensing, Inc. and/or Microsoft Corporation.

This System Builder Kit (SBK) is the only tool authorized by Microsoft to be used for the preinstallation of Windows Millennium Edition. As part of the license agreement for Windows Millennium Edition, OEMs are required to preinstall Windows Millennium Edition on their customer systems by using the methods and requirements described in the SBK.

Pursuant to the OEM license agreement, Microsoft Licensing, Inc. has granted you limited rights to modify or customize Windows Millennium Edition upon preinstallation on your computer hardware. These right or options and related requirements are explained in detail in this SBK. All rights to modify or customize

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Windows Millennium Edition not expressly set forth in your OEM preinstallation and distribution agreement, this SBK or other written document signed by Microsoft Licensing, Inc. are reserved.

Important Microsoft Licensing, Inc. reserves the right to change the preinstallation requirements in this section at any time with respect to future versions of Windows Millennium Edition.

You may customize Windows Millennium Edition as set forth in this SBK, but to comply with the terms of your OEM preinstallation and distribution agreement, you must meet the requirements defined in the following subsections regarding such customization.

The text in the left margin indicates which of the following elements helps maintain compliance with these requirements:

- **Wizard:** The Preinstallation wizard automatically maintains compliance with this requirement.
- **Product:** The Windows Millennium Edition product, as supplied by Microsoft, maintains compliance with this requirement.
- **Installer:** The OEM preinstallation engineer at the OEM facility ensures compliance.

“Preinstalled computer” refers to a computer that you provide to end users with the System Builder version of Microsoft Windows Millennium Edition operating system preinstalled.

Anti-Piracy

To increase the awareness of genuine Microsoft products, you must ensure that the following screens appear during end-user setup:

- User name/Company screens
- Microsoft End-User License Agreement screen
- Product Key ID (unless entered on behalf of the end user, using the key that appears on the Certificate of Authenticity sticker attached to the computer).

Do not modify or append any text to the online Microsoft End-User License Agreement (EULA) without express written permission from Microsoft Licensing, Inc.

You can, however, replace the term “PC Manufacturer” or “Manufacturer” with your company name or modify the warranties portion of the EULA to comply with local law without written permission from Microsoft Licensing, Inc.

OEM-Specific Information

Include an Oeminfo.ini file in the **PC:\Windows\System** folder. Add your company name after the Manufacturer= field in **PC:\Windows\System\Oeminfo.ini**.

Add your company-specific information in the **[Support Information]** section of the Oeminfo.ini file. It is recommended that you include your Internet URL for product support.

Important Do not list Microsoft or a Microsoft phone number for support information, either electronically on the preinstalled computer or in printed materials distributed with the computer unless explicitly authorized in writing to do so by Microsoft Licensing, Inc.

You may add your OEM logo on the Windows Millennium Edition splash screen. This logo requires the text "Distributed by" before the logo.

You may replace the Windows Millennium Edition watermark with your own company-branded watermark and add your logo to the upper-right corner of the Windows Welcome screens. You may also add your company name to the Start and Finish screens of Windows Welcome.

You may replace the default Windows Millennium Edition desktop wallpaper with wallpaper containing your own brand(s). In doing so, you may not use any Microsoft trademark without the written consent of Microsoft Corporation.

You may add your OEM Channel to the **Channels** folder located on the Favorites menu of Microsoft® Internet Explorer.

Windows Millennium Edition Software Components

Do not remove any standard Windows Millennium Edition component software from a preinstalled computer. Users expect consistent behavior from all computers upon initial startup, including all standard utilities and features.

All .cab files must be copied onto the hard disk to **PC:\Windows\Options\Cabs**.

Dual- or Multi-Boot Systems

Do not install or ship computers with more than one Microsoft operating system, such as an earlier version of MS-DOS® or Windows in addition to Windows Millennium Edition, without express written permission from Microsoft Licensing, Inc. Please

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see your OEM preinstallation and distribution agreement for further details.

Preinstalled Software

Do not configure any programs to be enabled, run, or initialized automatically—that is, without requiring a deliberate act of the end user—from an icon or folder on the desktop, from the **Start** menu, or by any other mechanism. This requirement includes, without limitation, any shells, screen savers, welcome scripts, wizards, or other content.

The exception to this requirement is any executable file required to support a hardware device on the preinstalled computer, including device drivers, hardware diagnostics (such as sound check), and virus-scanning software. However, no screens may appear to the end user unless the screen helps the user determine whether the hardware is installed and functioning properly.

Do not populate the **Startup** folder, Autoexec.bat, Boot.ini, Classes.dat, Config.sys, System.dat, System.ini, User.dat, or Win.ini files in any manner that causes any program or content to run or load automatically upon end-user startup, except for device drivers and diagnostics necessary to support preinstalled or preconfigured hardware devices, such as network cards, sound cards, and printers.

Product Customization

Do not modify in any way or delete any aspect of the Microsoft Windows Millennium Edition product software. This requirement includes, without limitation, any features, shortcuts, icons, wizards, folders, subfolders, or programs of the Microsoft Windows Millennium Edition product software acquired through the Microsoft OEM Distributor, except if and as specifically permitted in this section or as permitted in your separate preinstallation and distribution agreement. Do not modify or add content to any directories installed by the Microsoft Windows Millennium Edition product software, except as permitted in the SBK for preinstallation of applications by the OEM.

End-User Startup

Do not modify or obscure in any way the sequence or appearance of any screens displayed by the Microsoft Windows Millennium Edition product software as delivered by Microsoft from the time the target computer completes BIOS processing and transfers control to the software loaded from the hard disk ("end-user

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startup”) until the time the computer displays the Windows Millennium Edition desktop.

Following are the only exceptions to this requirement:

- You may run anti-virus programs hardware diagnostics and the programs’ enabling software, such as a sound check, provided it does not run any subsequent programs or download code for running either during Windows Welcome or later.
- You may disable the Microsoft Network Internet access offer, and either provide no Internet access offer or provide your own OEM Internet service provider (ISP) sign-up offer, provided that:
 - The ISP sign-up offer is written in HTML.
 - It does not run any programs or download code for running. The ISP program must be installed on the hard disk.
 - The last page in the OEM ISP offer contains a call that returns control to Windows Welcome.
 - You indicate your choice of ISP offers by selecting it in the Preinstallation wizard.
- You may provide the end user with the ability to configure a particular browser as the default browser, provided that:
 - The screen(s) relating to the default browser selection are written in HTML.
 - It does not run any programs or download code for running, or remove any part of Windows Millennium Edition.
 - The last page in the default browser choice contains a call that returns control to Windows Welcome.

Windows Millennium Edition makes Microsoft Agent available on all default Windows Welcome screens. When adding additional HTML pages as described above, OEMs are encouraged to include Microsoft Agent. In addition, OEMs should customize the support information that Microsoft Agent presents to end users. For information about Microsoft Agent, see the System Builder Web site at <https://oem.microsoft.com>.

The end-user startup consists of the following screens and programs:

- Regional settings and keyboard layout (optional)
- OEM-added hardware diagnostics (optional)
- Mouse tutorial (optional)
- IME tutorial (optional)
- Time zone (optional)
- Product registration (required)

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- ISP Sign-up (optional)
- EULA (required)
- Product key (required unless entered by OEM on behalf of the end user)

Do not use any portion of Microsoft Windows Millennium Edition product software to enable any programs or other content to run or appear before End-User Startup. The exception to this requirement is if the end user initiates this action after the completion of the first end-user startup.

Desktop

Do not modify, delete, or obscure in any way the appearance of the default desktop (including, without limitation, any features, shortcuts, icons, Active Desktop items, wizards, folders—including subfolders—or programs of Windows Millennium Edition as delivered by Microsoft in this SBK).

Following are the only exceptions to this requirement:

- You may replace the default Windows Millennium Edition desktop wallpaper with your own wallpaper; provided any trade names, trademarks, logos, or brands displayed in connection with such components shall be limited to those under which the your computer hardware is marketed and distributed in accordance with your OEM preinstallation and distribution agreement (Computer Hardware Marks).
- The wallpaper color or design must not in any way obscure the Microsoft Windows Millennium Edition desktop icons, **Start** button, or **Start** menu.
- You may add icons or folders to the desktop, provided that:
 - Any such icons are the same size and substantially similar shape as icons included on the desktop as delivered by Microsoft.
 - Any such folders are the same size, shape, and appearance as folders included on the desktop as delivered by Microsoft.
- You may also add Active Desktop items, including background wallpaper, Web site, and channel links, to the Active Desktop provided that:
 - Any trade names, trademarks, logos, or brands displayed in connection with such components shall be limited to Computer Hardware Marks.
 - Channel links shall include your company's Premium Channel added to the Channels list located in the Favorites list of Microsoft Internet Explorer that can link to your Web site or

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content installed on the hard disk of the customer system. You may add Subchannels to your Premium Channel with links to your company's or third-party Web sites or content installed on the hard disk of the computer.

- The wallpaper color or design does not in any way obscure the Microsoft Windows Millennium Edition desktop icons, **Start** button, or **Start** menu.

Do not replace, remove, or supersede any of the End-User Startup components except for the following.

Internet Explorer

You may modify the following:

- The default start page URL
- The default run once page (URL)
- The default search page URL
- The default Help page URL

In addition, you may:

- Display the Microsoft preloaded favorite items in the Favorites list of Microsoft Internet Explorer, as loaded by default during the preinstallation process.
- You may add one folder at the highest level under the **Favorites** folder. Any additional URLs or Internet Explorer folders that are preloaded cannot be placed at a level higher than this folder.
- You may not remove the Microsoft preloaded favorite items in the Favorites list of Internet Explorer.
- You may not replace the **Internet Explorer** icon that appears in the upper-right portion of the Internet Explorer window and other windows in Windows Millennium Edition.

PC Health

Help and Support

- You may add co-branding, customized colors, images, backgrounds, and fonts to various parts of Help and Support in Windows Millennium Edition, including the navigation bar and default pages.
- You may add custom pages to Help and Support content provided they are properly indexed to the taxonomy.
- You may add customized categories to the defaults provided.

- You may add your own customized content to the main Help and Support page provided the existing taxonomy is not changed.
- You may add elements to the navigation bar provided they appear to the left of all required default elements.

System Restore

- You may change the checkpoint and maximum size of data store.

Control Panel Extensions

Microsoft Corporation has published a white paper that describes the requirements for Control Panel extensions, as well as specific implementation details for custom property pages for Microsoft Windows 95, Windows 98, and Windows Millennium Edition. This paper, "Implementing Display Control Panel Extensions in Windows 95 and Windows 98," is available at <http://www.microsoft.com/hwdev/devdes/displaycpl.htm>. Requirements for Display properties extensions include the following:

- **Existing property pages must remain unchanged.** You must not disable, modify, remove, or replace any Microsoft-provided property page (including **Settings**), except for adding an **Advanced Properties** button (if one does not exist) to comply with the following item.
- **Custom property pages can be added only under Advanced Properties.** The features exposed at the top level are commonly used features included in every Windows system. Because Windows Millennium Edition supports multiple displays, you cannot add custom property pages to the top-level property page set in **Display properties**.
- **Control Panel extensions must interoperate with existing Windows Millennium Edition Control Panel elements.** In other words, changes made in one are reflected in the other.
- **Custom property pages must be labeled with an icon in addition to the text name.** To prevent conflicts with future operating system or shell releases, third-party tabs must contain the page label plus either an icon with the company's logo or text with the name of the vendor.
- **Control Panel extensions must not initialize if the necessary hardware/driver combination is not present.** If the display hardware that ships with the custom control panel is not present, the custom control panel should not appear.

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Likewise, if a custom property page has features that are dependent on proprietary driver extensions (for example, extensions that are not guaranteed to be present in every other display driver), those features must disable themselves, or the property page must not appear unless the necessary driver is installed.

- **Only valid modes and refresh rates settings for the installed monitor and adapter are available by default.** A Control Panel extension can provide an override capability for refresh rate selection, but a warning must appear when it is enabled.
- **Control Panel state must be stored in the registry.** No .ini files are allowed. Any state that is maintained by your Control Panel extension must be stored in the Software key in the registry, accessible through HKR in the .inf for the device.
- **Control Panel files must be installed using the display driver .inf.** The extension dynamic-link libraries (DLLs) that make up the new property page (or pages) must be listed in the **[CopyFiles]** section of the .inf file. Additionally, the Guide for the Control Panel extension must be in the **[AddReg]** section of the display driver .inf to install the .cpl file in the registry.

Software Components that Support Hardware

Do not modify the Microsoft-supplied .inf files in the **PC:\Windows\Inf** folder, with the following exceptions:

- You can add a separate set of .inf files for detection during Setup.
- You can modify .inf files if you need to change a text string or add new device information.

However, you must not comment out or remove sections of the .inf files in the **PC:\Windows\Inf** folder. If you do, the end user is not ensured of correct hardware detection when adding new devices to the computer.

Note that if you modify .inf files, you risk creating problems with future product releases, where existing .inf files are replaced automatically. (Plug and Play architecture has no version checking.)

Whether you ship a legacy or Plug and Play version of any CD-ROM drive, network card, or sound card, you must turn on detection for at least one device within the class being shipped. Turning on

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detection ensures that the software components associated with that device are installed.

Do not remove any legacy detection items that Microsoft force-detects.

For any of the following hardware provided on a preinstalled computer, you must install the following related software components:

- **Network card:** Net Watcher
- **Sound card:** Audio Compression, Sample Sounds, Sound Recorder, sound schemes, and Volume Control
- **TV Tuner:** Microsoft WebTV for Windows

SBK and Its Components

Do not preinstall Windows Millennium Edition by using any method other than those detailed in the SBK.

Do not remove, replace, or modify any other product logos or trademarks (as noted in your OEM preinstallation and distribution agreement) included in the Microsoft Windows Millennium Edition product.

Do not remove, replace, or modify the Windows Millennium Edition Startup Screen Logo except by using either the Preinstallation wizard or the Oemstamp tools provided with the SBK.

Do not use the tools included in the SBK on a non-Microsoft operating system.

Do not redistribute any documentation files included with the SBK without express written permission from Microsoft.

Do not ship to end users any of the following tools:

- The tools defined in the SBK as "OEM Factory-only tools." These tools are distinguished by the letter "O" in front of them, such as Oattrib.exe, Oformat.com, Oxcopy.exe, and Ofdisk.exe.

These files have been modified to remove their version stamping, and several have features that can be damaging to end-user computers if they are not used properly.

Overview of the Process

The following overview of the preinstallation processes can help simplify the process of preinstalling Windows Millennium Edition. It's important to read this guide and thoroughly understand the five phases of the preinstallation process.

Phases 2, 3, and 4 are required to preinstall Windows Millennium Edition. Phase 1 and 5 are optional. You need to go through Phases

2 and 3 only once for each for each model or hardware configuration you ship.

Phase 1: Customize Files for Windows Welcome (OOBE) Configuration (optional)

- Customize Windows Welcome.

Phase 2: Run the Wizard (required)

- Set up the Preinstallation wizard.
- Run the Preinstallation wizard to create a configuration set.

Phase 3: Create Startup Disks (required)

- Create a Preinstallation Boot Floppy Disk.
- Use the Preinstallation Boot Floppy Disk to start up your target computer so that you can preinstall Windows Millennium Edition. The target computer, at this point, has no operating system installed.
- Create an end-user startup disk that includes the real-mode CD-ROM device drivers for your customer computer.

Phase 4: Transferring to the Target Computer (required)

- Download the Windows Millennium Edition files from the Windows Me SB CD to the target computer.

Phase 5: Post-Preinstallation Operations (optional)

- Audit or test your system to simulate the end-user experience.
- Preinstall licensed applications if you are providing them with your computer hardware.

Required Equipment

Before you run the Preinstallation wizard, make sure you have the following equipment and minimum system requirements:

- Reference computer (the computer on which the wizard and other tools are located):
 - A computer running Microsoft Windows 95 OSR2, Windows 98, Windows 98 Second Edition, Windows Millennium Edition, Microsoft Windows NT® version 4.0, or Windows 2000, that has at least 500 MB of free hard disk space, a CD-ROM drive, and Internet Explorer version 5.0 or later.

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- Target computer (the computer system on which Windows Me will be preinstalled):
 - A Windows Millennium Edition-compatible computer that has at least 800 MB of hard disk space and a bootable 3.5-inch floppy disk drive. This is a minimal configuration and assumes no customization.

Unless you use hard-disk duplication equipment to preinstall Windows Millennium Edition, the target computer must also have either a network adapter or a CD-ROM drive. You do not necessarily have to ship this hardware with the final computer.
- Real-mode device drivers for the target computer's CD-ROM drive if the generic drivers provided with the SB tools do not support your hardware.
- The preinstallation instructions assume the target computer is clean (that is, with no operating-system files in the root directory, no **Windows** folder, no drive compression, and so on). The wizard preinstalls Windows Me on computers that do not contain a previous operating system. The preinstallation process is not for upgrading computers to a newer version of the operating system.
- A blank floppy disk (for the Preinstallation Boot Floppy Disk for the target computer).
- Optionally, a second blank floppy disk if you intend to create a CD-ROM startup floppy disk for the end user.

You also need to have the following information:

- The manufacturer name under which you will sell the computer, the model name, and how your customers will receive technical support (telephone and fax numbers, World Wide Web site, and any other information you'd like to provide to your customers).

Additional Information

You can find additional information about Windows Millennium Edition on the Microsoft System Builder Web site. The SB Web site has details about pre-populating the Product Key, and includes white papers on:

- PC Health Help and Support
- Microsoft Agent
- ISP signup

The Web site also includes information about the software development kits (SDKs) for PC Health Help and Support and for

Microsoft Agent. See:
<https://oem.microsoft.com>

Using the Preinstallation Wizard

Before you start the Preinstallation wizard, make sure that you:

- Read the directions in the System Builder printed documentation, "Getting Started: How to Set Up the System Builder Preinstallation Wizard for Windows Millennium Edition."
- Read the next section in this document, "Quick Guide to Preinstalling Windows Millennium Edition."
- Read the section, "Phase 1: Customize Files for Windows Welcome (OOBE) Configuration," which follows the "Quick Guide" section.

Quick Guide to Preinstalling Windows Millennium Edition

To get started immediately, follow the steps below.

1. Follow the instructions in "Getting Started: How to Set Up the System Builder Preinstallation Wizard for Windows Millennium Edition."
2. Run the Preinstallation wizard.
 - a. Click **Start**, point to **Programs**, and then click **MS-DOS Prompt**.
 - b. At the command prompt, switch to the **Wizard** folder. Type **opkwiz** to run the wizard. The Welcome to the Preinstallation Wizard page appears. Click **Next** to go the next page.
 - c. On the Configuration Set page, create a new configuration set or select an existing configuration set to update, and then click **Next**.
 - d. On the Real-Mode Lines for Factory page, edit the Config.sys and Autoexec.bat files, and then click **Next**.

You must edit the following three lines in Autoexec.bat in the **[Network Logon]** section:

```
REM syntax set source=p:  
REM syntax set cfgdir= ModelX  
REM syntax LH MSCDEX.EXE /D: mscd001 /L:p
```

Edit the above lines to remove the "REM syntax" on the left side for these three lines only, where:

in set source=p: "p" is the CD-ROM drive letter on the target

computer;

in set cfgdir=ModelX "ModelX" is the configuration set name;

in LH MSCDEX.EXE /D:mscd001 /L:p "p" is the same drive letter as the source statement).

Important It is *critical* that you correctly set these two variables, *source* and *cfgdir*, and the CD-ROM command line in the factory Autoexec.bat. For the source variable, don't leave a trailing backslash or spaces, and be sure to include the colon (:) after the drive letter. The *source* variable tells the pre-load process where to find the files it needs to complete the preinstallation process. If this isn't set correctly, many errors can occur. Make sure there is no colon after the drive letter for the CD-ROM drive on the Mscdex.exe command line.

- e. On the Logo Information page, click **Next**.

Click the **Help** button to read the Preinstallation wizard Help for more information about branding options.

- f. On the Windows Welcome Branding Options page, type the corporate name that you want to appear during Windows Welcome, in addition to the model name of the computer being preinstalled, and the customer support information you want to provide to your end users.

Proceed through the rest of the wizard pages by clicking **Next**.

- g. On the Save Configuration page, type the name of the configuration set or verify the name of the configuration set you are updating, and then click **Next**.

3. Create a Preinstallation Boot Floppy Disk (PBF).

- a. Click **Start**, point to **Programs**, and then click **MS-DOS Prompt**.

- b. At the command prompt, switch to the **Wizard** folder on the reference computer.

- c. Insert a blank floppy disk, type **Mkpbfbat** *configuration_set_name [drive letter]*, and then press ENTER to create the Windows Preinstallation Boot Floppy Disk.

For example, to create a startup floppy disk for the configuration set named ModelX, you could type: **mkpbfbat modelx a:**

4. Transfer files to the target computer from the Windows Me CD:

- a. Insert the Windows Me CD in the CD-ROM drive on the target computer.
- b. Insert the Preinstallation Boot Floppy (PBF) Disk into the target computer's floppy disk drive, and start up the computer.
The startup sequence on the PBF Disk automatically prepares the target computer to connect to the CD-ROM drive.
- c. Remove the disk when prompted, and press any key to continue the preinstallation process.
The preinstallation process continues without user intervention until you receive a message indicating that setup is complete and it is time to shut down or audit the computer.
- d. When the preinstallation process finishes, audit the computer.
Auditing allows you to test the computer or install applications without destroying the end-user experience.
- e. When you have finished auditing, shut down the computer by clicking **Shutdown** in the **OEM Reset Reminder** dialog box.
At this point, your target computer is ready to ship to the customer.

Be sure to read this entire document for more details about the preinstallation process.

Phase 1: Customize Files for Windows Welcome (OOBE) Configuration

Windows Welcome is a series of full-screen, HTML-based pages that offers end users an easy and streamlined way of getting a personal computer that is running a new preinstalled copy of Windows Millennium Edition started and connected to the World Wide Web.

You can customize certain aspects of Windows Welcome, combining your own System Builder enhancements with its core setup functionality. This includes customizing ISP sign-up, specifying your own home, search, and support URLs for Internet Explorer, adding toolbar buttons to Internet Explorer, and placing your company name, logo, and a watermark graphic into Windows Welcome.

Note If you want to customize Microsoft Internet Explorer or develop an ISP sign-up offer, see the information on the System Builder Web site at:
<https://oem.microsoft.com>.

One of the unique characteristics of Windows Welcome is the way it incorporates the computer's dial-up capabilities to handle ISP

sign-up tasks. Windows Welcome requests a minimum amount of information to dial out, such as country, area code, and any needed "dial out" number. If a phone connection is established, the online pages of the Windows Welcome process are served up. From there, the end user can register Windows Me and open an Internet account with an ISP. If a phone connection cannot be established, local versions of the various Windows Welcome screens appear. You can find additional information about customizing Microsoft Internet Explorer and developing an ISP offer on the System Builder Web site:
<https://oem.microsoft.com>.

Preparing Files for Windows Welcome Configuration

To take full advantage of the configuration options offered in the Preinstallation wizard, it is important that you read through this documentation first before you start the Preinstallation wizard. Certain aspects of the configuration require that you customize particular files, and in some cases, provide the files.

Customizing Windows Welcome

You can customize Windows Welcome with your own branding. You can do so in three ways. Each of these are described in greater detail following this list:

- Add your corporate name to the Welcome and Finish screens.
- Add a watermark graphic in the background of Windows Welcome.
- Add a logo in the upper-right corner of Windows Welcome.

Add Your Corporate Name

When you add your corporate name to Windows Welcome, it appears on the Opening screen of Windows Welcome. The text reads as follows:

Thank you for purchasing a *OEM name* computer
with Microsoft Windows Millennium Edition

You incorporate your corporate name into Windows Welcome by adding it in the appropriate page in the Preinstallation wizard.

Add a Windows Welcome Watermark Graphic

You can also add a watermark graphic to appear as wallpaper in the display pane of the Windows Welcome screen the first time the end user runs Windows Me.

To add a watermark graphic

1. Create a graphic that is large enough to fill the entire display pane. The graphic should be in GIF format, based on the

Windows 256-color palette, and have dimensions of 610 pixels high by 600 pixels wide. In addition, the watermark graphic should not in any way obscure the Windows Welcome text or buttons.

2. Name the file Watermrk.gif.

You are now set up to choose the watermark graphic option when you run the Preinstallation wizard.

Add a Logo to Appear in Windows Welcome

You can also add a logo that will appear in the upper-right corner of Windows Welcome.

To add a logo to Windows Welcome

1. Create a graphic. The graphic should be in GIF format, based on the Windows 256-color palette, and have dimensions of 48 pixels high by 557 pixels wide. If the image is larger than the specified dimensions, Windows Welcome truncates it.
2. Name the file Oemlogo.gif.

Important This .gif logo file is different from Oemlogo.bmp.

You are now set up to choose to add a logo when you run the Preinstallation wizard.

Phase 2: Run the Wizard

In this phase, you have already set up the wizard and are ready to run it to create your configuration set.

Note To edit an existing configuration set, at the command prompt, type **opkwiz /m: <configuration_set>**.

To start the Preinstallation wizard

1. Click **Start**, point to **Programs**, point to **Accessories**, and then click **MS-DOS Prompt**.
2. At the command prompt, switch to the **Wizard** folder. Then type **opkwiz** to run the wizard.

1. Welcome to the Preinstallation Wizard

1. Read the Welcome to the Preinstallation Wizard page, and then click **Next**.

2. Configuration Set

2. On the Configuration Set page, either create a new configuration set or select an existing configuration set to update. Then click **Next**.

3. OEM Branding Information

3. On the OEM Branding Information page, type your corporate manufacturer name, the model name of the computer being preinstalled, and the customer support information you want to provide to your end users. Then click **Next**.

Note You must supply a manufacturer name and support information. Make sure that you have spelled all items exactly the way you want the text to appear in the product. The model name is optional. Remember, you can't list Microsoft in the support information area.

4. Legacy Device Class Detection

4. On the Legacy Device Class Detection page, verify that check boxes are selected for all legacy devices you want to be detected on the target computer. Clear the check boxes for any legacy device classes or device modules that you don't want detected, and then click **Next**.

You can speed up the factory preinstallation process by limiting legacy device detection to only those classes of devices used in the target computers.

5. Real-Mode Lines for Factory

5. On the Real-Mode Lines for Factory page, you must edit the Config.sys and Autoexec.bat files and then click **Next**.

You must edit the following three lines in Autoexec.bat in the **[Network Logon]** section:

```
REM syntax set source=p:
REM syntax set cfgdir= ModelX
REM syntax LH MSCDEX.EXE /D:mscd001 /L:p
```

You must edit the above lines to remove the “REM syntax” on the left side for these three lines, where:

- in SET Source=p: “p” is the CD-ROM drive letter;
- in SET Cfgdir= ModelX “ModelX” is the configuration set name from step 3, above;
- in LH MSCDEX.EXE /D:mscd001 /L:p “p” is the same drive letter as the Source statement.

Important It is *critical* that you correctly set these two variables, *source* and *cfgdir*, and the CD-ROM command line in the factory Autoexec.bat. You must set the *cfgdir* variable to the name of the configuration set, not the path name. Setting this variable to anything other than the name of the configuration set causes preinstallation to fail.

For the *source* variable, don't leave a trailing backslash or spaces, and be sure to include the colon (:) after the drive letter. The *source* variable tells the pre-load process where to find the files it needs to complete the preinstallation process. If this isn't set correctly, many errors can occur. Make sure that no colon appears after the drive letter for the CD-ROM drive on the Mscdex.exe command line.

6. Logo Information

6. On the Logo Information page, select **System Properties** or **Startup screen**, or both check boxes if you want to display custom logos in both locations. Then click **Next**.

Logo information is optional; however, if you select the check box for either of the bitmaps on the Logo Information page, you must provide the related path and bitmap file name.

The following table shows the required bitmap sizes.

| Logo display location | Bitmap file name | Bitmap size and color depth |
|-----------------------|------------------|--|
| System properties | Oemlogo.bmp | 96 by 96 pixels (small fonts) 120 by 120 pixels (large fonts) |

| | | |
|----------------|----------------------------|------------------|
| | | 256 colors |
| Startup screen | Logo.bmp | 150 by 22 pixels |
| | (converted to Logo.sys) | 256 colors |

The bitmap size for the **System properties** icon in Control Panel isn't fixed and depends on the **Display Font Size** setting because the **System Properties** dialog box size is scaled to the font size.

7. Application Preinstallation Launcher

7. On the Application Preinstallation Launcher page, click **Add** to identify each additional program to run during auditing. In the **Application Preload Information** dialog box, specify the path to the program's setup file and the command line for preinstalling the program. For example, if "Awesome" is the name of an application's setup file that requires you call the parameter "*Awesome_setup*," the path and command-line switch to enter is:

C:\WINDOWS\AWESOME\AWESOME.exe AWESOME_SETUP

This command line sets up that program to run during auditing, which is automatically invoked at the end of Windows preinstallation.

- If the application setup program uses DDE or OLE, select the **DDE/OLE** check box.

A new feature has been added to the Application Preinstallation Launcher, where applications that require DDE/OLE can be processed in an order specified by the System Builder. Those that do not require DDE/OLE are processed in the order in which they are entered.

For any item listed on the Application Preinstallation Launcher page, you can edit the preload parameters by selecting the item on the list and then clicking **Edit**.

When you have defined all preload programs as you want them to appear on the Application Preinstallation Launcher page, click **Next**.

8. Windows Welcome Branding Options

8. On the Windows Welcome Branding Options page, type the corporate name that you want to have appear during Windows Welcome.

To add a watermark graphic, click **Browse** to locate the file. Once the file is located, select it, and then click **OK**.

To add a logo, click **Browse** to locate the file. When the file is located, select it, and click **OK**.

The watermark graphic and logo must be prepared in advance of running the Preinstallation wizard.

Click **Next**.

9. Windows Welcome Options

9. On the first Windows Welcome Options customization page, select whether you would like a mouse tutorial to be displayed during the Windows Welcome process.

10. More Windows Welcome Options

10. On the second Windows Welcome Options page, select whether you would like the Regional Settings and Keyboard screen to appear when the end user first starts Windows Me. This option is useful if you do not know the end user's locale or keyboard. A new feature added with Windows Me allows you to prompt the user for their time zone during Windows Welcome. This was previously done after the Windows Welcome process.

11. Windows Welcome Hardware Detection

11. On the Windows Welcome Hardware Detection page, you can optionally show an error page if the user has not correctly connected their USB Mouse and Keyboard. Note that this feature is only available for USB devices. Sample pages for this are available from the System Builder Web site.

12. PC Health Help and Support Customization

12. On the PC Health Help and Support Customization page, select the types of customization you will use and enter the paths to the files. For detailed information about customizing the Windows Millennium Edition Help and Support page, see the System Builder Web site at <https://oem.microsoft.com>.

13. Windows Welcome Internet Signup Options

13. On the Windows Welcome Internet Signup Options page, click the option you want to present to the end user. The options are:
 - **Use MSN Internet Access integrated ISP sign-up.** Click this option if you want MSN® (The Microsoft Network) to be the Internet service provider (ISP) of choice. The first time the end user runs Windows Me, ISP sign-up with MSN occurs only if the computer is connected to an active phone line. If the computer is in offline mode, ISP sign-up with MSN is skipped.
 - **Do not include ISP signup in Windows Welcome.** Click this option if you do not want to present the end user with an ISP offer.
 - **Pre-configure Internet settings at factory.** Click this option if the system will have an operational, ready-to-use Internet account already installed on the first time the end user runs Windows Me.
 - **Display a pre-cached (local) list of ISP offers.** Click this option if you will be presenting the end user with your own OEM ISP offer. To make ISP sign-up available to the end user from the desktop after Windows Welcome, select the **Specify a setup of ISP signup files** check box. Then, click **Browse** to locate the ISP sign-up offer files. When these are located, click **OK**, and then click **Next**.

14. Browser Toolbar Buttons

14. On the Browser Toolbar Buttons page, you can add or customize the Internet Explorer toolbar buttons in the user's browser. You can specify the script or program that the buttons run, in addition to their appearance. Note that you may not obscure or delete the default browser buttons. By clicking the **Add** button, the following information can be added:
 - Add tooltip text that appears when the mouse is over the toolbar button.

- Browse for the script or executable file that you want to have run when the user clicks the toolbar button.
- Browse for the color toolbar icon that appears when the mouse passes over the toolbar button.
- Browse for the grayscale toolbar icon that is visible when the mouse is not over the toolbar button.

15. Important URLs

15. On the Important URLs page, type the URLs that you want to use for each of the following options:
 - **Home page URL.** You can specify and test the URL for the page that the browser displays whenever the end user opens it for the first time or clicks the **Home** button.
 - **Search bar URL.** You can specify and test the URL for the page that the browser displays whenever the user clicks the **Search** toolbar button or menu command.
 - **Online support page URL.** You can specify and test the URL for the page that the browser displays whenever the user clicks **Online Support** on the **Help** menu.

Click **OK**, and then click **Next**.

16. Favorites and Links

16. On the Favorites and Links page, click the location in the tree where you want the URL to appear.
 - To add a new URL, click **Add URL**, and then type the complete URL in the box that appears.
 - To add a new folder, click **Add Folder**, type the folder name you want, and then click **OK**. You can then add URLs to the new folder.

Click **Next**.

17. Channels

17. Using this page, you can add a custom channel or channel category (folder).

To add a custom channel or channel category, you should already have information about your channel or channel category, such as the path to the images and the titles you want to use. You should also have a Channel Definition Format (.cdf) file for each channel.

18. Save Configuration

18. On the Save Configuration page, either type the name of the configuration set or verify the name of your existing configuration set you are updating. Then click **Next**.

Important Use 8.3 folder names for the configuration set folder and for any target folders you create during the preinstallation process. The MS-DOS-based preinstallation batch files don't support long file names.

For more information about managing long file names, see the "Microsoft Windows 98 Resource Kit."

This completes the Preinstallation wizard portion of the preinstallation process.

Phase 3: Create Startup Disks

In this phase, you create a Preinstallation Boot Floppy (PBF) Disk and a CD-ROM Boot Disk that installs Windows Millennium Edition from the Windows Me SB CD. A boot disk can recover a failed system. The end user starts up the computer with this disk, which also runs Oemsetup from the CD-ROM drive in the event that Windows Me must be reinstalled.

To create a Preinstallation Boot Floppy (PBF) Disk

1. Click **Start**, point to **Programs**, point to **Accessories**, and then click **MS-DOS Prompt**.
2. At the command prompt, switch to the **Wizard** folder on the reference system.

For example, if your reference system is on drive C, type **c:** at the command prompt. Then, type **cd \wizard** and press ENTER to switch to the **Wizard** folder.
3. Insert a blank floppy disk, type **Mkpbf.bat**
configuration_set_name [drive_letter], and then press ENTER to create the Windows Preinstallation Boot Floppy Disk.

For example, to create a startup floppy disk for the configuration set named ModelX, you could type: **mkpbf modelx a:**

4. When prompted, type the letter of the floppy disk drive, and then follow the instructions on your screen.

Mkpbf.bat automatically configures the Preinstallation Boot Floppy Disk to connect the target computer to your CD-ROM drive.

To create an end-user CD-ROM startup disk (for recovering a failed system)

1. At the command prompt, switch to the **Wizard** folder.
2. At the command prompt, type **mkcdboot.bat config_set_name [drive_letter]**, and press ENTER.

For example, to copy the CD boot image for the configuration set named ModelX, insert the floppy disk, and then type **mkcdboot.bat modelx** at the prompt. Note that generic CD-ROM drivers are provided, and they are configured on the CD-ROM startup floppy disk. If these drivers support your hardware, you do not need to edit any files on the floppy disk.

Phase 4: Transferring to the Target Computer

Now Windows Millennium Edition can be copied to the target computer. This transfer occurs automatically until preinstallation is complete and the target computer is ready to be shut down and shipped or audited.

Note The default behavior of the PBF disk assumes that the target computer is completely empty (that is, there are no partitions, or no software is installed). If you want to override the check for hard disk status, add **/C** to the end of the **preload** line in Autoexec.bat. Doing so causes the PBF Disk to always format the hard disk.

To transfer files from a source in the CD-ROM drive of the target computer

1. Make sure the target computer is turned off.
2. Insert the Windows Me CD in the CD-ROM drive of the target computer.
3. Insert the Preinstallation Boot Floppy (PBF) Disk into the target computer's floppy disk drive, and then start up the computer.

The startup sequence on the PBF Disk automatically prepares the target computer to connect to the CD-ROM drive.

4. Remove the disk when prompted, and then press any key to continue the preinstallation process.
5. The preinstallation process continues without user intervention until you receive a message indicating that Setup is complete and it is time to shut down or audit the computer.
6. When the preinstallation process finishes, shut down the computer by clicking **Shutdown** in the **OEM Reset Reminder** dialog box.

Phase 5: Post-Preinstallation Operations

At this point, your target computer is ready to ship to the customer. Before shipping the computer, you might want to perform one of the auditing options discussed below. You can audit the computer repeatedly without destroying the integrity of the end-user experience.

Auditing Your Newly Preinstalled Computer

Auditing allows you test the computer or install applications without destroying the end-user's Windows Welcome experience. Auditing is invoked automatically by the factory preload process. You can restart the computer in audit mode by clicking the Audit Boot button in the **OEM Reset Reminder** dialog box. Regardless of the number of times you restart in audit mode, the audit continues to function until you click the **Shutdown** button on the **OEM Reset Reminder** dialog box.

Preinstalling Applications

OEMs typically preinstall a wide variety of applications on computers before shipping them to end users. Unfortunately, most application setup programs are designed for end-user setup, not for OEM factory preinstallation. Microsoft is limited in what it can do to assist you with the process of installing applications automatically if the applications aren't designed for it. It's very difficult to develop a single generic solution that changes the installation behavior of all shipping applications to allow them to install automatically in a preinstallation environment. It is better, therefore, to treat each application on a case-by-case basis and make the independent software vendor (ISV) who wrote the

original program responsible for creating an OEM application preinstallation script. Then, if there are any problems with the setup of that application, the ISV has the incentive and the capability to make the changes necessary to set up the programs appropriately.

However, ISVs need to know what you need in a preinstallation script for their application setup program. Microsoft Corporation has published a set of recommendations for ISVs on how to develop OEM preinstallation scripts. Entitled "Creating OEM Preinstall-Friendly Applications for Windows-Based PCs," this white paper, available only in English, is intended to push the application industry forward with respect to this important OEM issue. This document is available in the Technical Articles book available from the MSDN library.

By becoming familiar with the preinstallation issues, you can encourage the ISVs you work with to adopt its guidelines so that you can easily preinstall their programs.

Important As noted in the requirements and restrictions listed at the beginning of this document, you cannot configure preinstalled applications to run automatically from Windows Millennium Edition. You may place icons in the submenus off the **Start** menu (though not in the **Start Menu** folder itself) or on the desktop to run when an end user initiates them.

Application Preinstallation Scenarios

This section describes two primary scenarios for application preinstallation, as follows.

- **Scenario 1: The software manufacturer followed Microsoft application preinstallation setup guidelines.**

This represents the ideal scenario in which the software manufacturer has followed Microsoft's recommendations listed in the "Creating OEM Preinstall-Friendly Applications for Windows-Based PCs" white paper, and you only have minimal work to prepare the application for preinstallation.

- **Scenario 2: The software manufacturer provides no install script, and the setup program asks for user input.**

This represents the worst-case scenario, where the software manufacturer didn't conform to any of the recommendations. You need to run the setup application and identify the changes of their setup application during installation, and then duplicate that behavior in your setup scripts. You also need to consider other variables, depending on how well the ISV implemented the guidelines discussed in the white paper. You need to identify:

- Copying, deleting, creation, and replacement of files
- Changes to application files
- Changes to the registry and Windows files
- Creation of long file names (LFNs)
- Required user input or user intervention

To identify the changes made by an application, copy the tree structure for your computer, including hidden files, to a share point on your network. Install the application, and then use a comparison tool, such as Windiff.exe, to compare the pre-application setup and the post-application tree structures.

If the setup application made any of the above changes to the registry, make sure these steps are performed in the appropriate phases mentioned in the white paper.

Registry changes have to occur after the software is on the target computer. Long file names (LFNs) can't be used until after Windows Millennium Edition has been booted for the first time, unless the LFNs are backed up and later restored using a tool such as Lfmbk.exe. Windows system file replacement can occur during any phase of preinstallation, but the script/setup application needs to ensure that the setup application isn't installing an older versions of system files. Lastly, user input or user intervention shouldn't occur until Phase 4.

Preinstalling Applications Scenarios

The following sections present procedures and alternatives to help you preinstall applications for each possible scenario.

Scenario 1: The ISV Followed the White Paper Guidelines

| Advantages | Disadvantage |
|--|--|
| The application is easy to add to your Windows Me preinstallation process. | A limited number of ISVs follow these recommendations today. |
| The application works before the computer leaves the factory and, if the ISV fully followed the recommendations in the white paper, you can "audit" the application before it leaves your factory to ensure that it works correctly. | |

1. Run the non-hardware-specific script to generate the application's post-install tree structure.
2. Share the post-install tree structure on a server. Define this share point in the **[Network Logon]** section of Autoexec.bat and on the Real-Mode Lines for Factory page (Phase 1, step 6).

If the share point is different from the one used for the Windows Me preinstallation, you need to add another line to connect to that share.
3. On the Real-Mode Lines for Factory page, add a line to connect to the application server and a line to Xcopy the post-install tree structure off the server. Add a line to the Application Preinstallation Launcher page that starts the setup program on the local drive.

In the Application Preinstallation Launcher page, add the hardware-specific script as an Audit RunOnce item.

Scenario 2: ISV Provides No Preinstallation Script Support, and Their Setup Application Asks for User Input

If the ISV doesn't follow the guidelines in the white paper, you have a lot of work ahead of you to be able to install the application automatically on multiple computers. Select from one of the following procedures.

- **Alternative 1**

| Advantage | Disadvantage |
|--|-------------------------------------|
| The installation is simple, using the ISVs installation process. | It is a manually-intensive process. |
| <ol style="list-style-type: none">1. Audit the computer by using non-restorative auditing. (See "Auditing Your Newly Preinstalled Computer" earlier in this document for details on your auditing.)2. Manually install the application from your local drive within Windows Me as if you were the end user.3. Click Shutdown in the OEM Rest Reminder dialog box to clean up the auditing session. | |

- **Alternative 2**

| Advantages | Disadvantages |
|------------|--|
| | You'll need to make sure you delete the temporary folder after you are done. |

Microsoft System Builder Preinstallation User's Guide for Windows Millennium

Advantages

Disadvantages

If you install a lot of programs in this manner, the programs on the hard disk will be scattered around the disk. To fix this, you need to defragment the hard disk after you have installed all the applications.

1. Use the Preinstallation wizard to add Setup as an Auditing RunOnce item from the Application Preinstallation Launcher page.
2. Share the presetup tree structure on the network.
3. On the Real Mode Lines for Factory page of the wizard, add a line to connect to the application server and a line to Xcopy the post-install tree structure off the server. Add a line to the Application Preinstallation Launcher page that starts the setup program on the local drive.
4. In the Application Preinstallation Launcher page, add the hardware-specific script as a Factory RunOnce item.

• Alternative 3

Advantages

Disadvantages

Pre-feeding user information with false values isn't the intended use of the Setup program and may cause problems for the user later, especially if online registration is involved.

This process is very time-intensive, especially when multiple applications are installed.

The ISV who wrote the program might not be able to support you, since the ISV isn't familiar with the way you installed the program.

1. Use a generalized scripting tool to create an install script, using false values for user entry screens.

Important Microsoft does not endorse, either explicitly or implicitly, the practice of using false information in application user-entry screens. However, we recognize this practice is common in the industry and therefore mention it here. You should discuss this with your ISV before following this procedure. Direct the ISV to the white paper if questions arise about how to develop OEM preinstallation scripts that don't use false information.

2. Share the presetup tree structure on the network. On the Real Mode Lines for Factory page of the wizard, add a line to connect to the application server and a line to Xcopy the post-install tree structure off the server.
3. Use the wizard to add the script launcher and script as an Audit RunOnce item on the Application Preinstallation Launcher page.

Applications, DDE, and OLE

If your setup application uses DDE or OLE, you might experience some problems installing the setup application through the Application Preinstallation Launcher page unless you select the **This install program requires DDE\OLE** check box. The Windows Millennium Edition shell calls RunOnce, and the shell blocks all incoming and outgoing DDE or OLE calls during the RunOnce process. This blocking behavior can be incompatible with any setup application that uses DDE or OLE.